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(54) **METHOD FOR DIALING FROM INTERNET
EXTENSION TO CONVENTIONAL
EXTENSION**

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H04M 7/00 (2006.01)
H04L 12/66 (2006.01)

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CPC **H04M 7/0024** (2013.01); **H04L 12/66**
(2013.01)

(58) **Field of Classification Search**
CPC ... H04L 12/66; H04L 65/104; H04L 65/1069;
H04L 65/608; H04M 7/0024; H04W 4/16
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,956,848	B1	10/2005	Keung et al.	
7,496,672	B2 *	2/2009	Orton et al.	709/230
8,204,183	B2 *	6/2012	Hwang et al.	379/88.17
8,284,763	B2 *	10/2012	Lee et al.	370/352
2002/0176374	A1 *	11/2002	Lee et al.	370/260
2006/0045076	A1 *	3/2006	Lim	370/352
2006/0187900	A1 *	8/2006	Akbar	370/352
2007/0070985	A1 *	3/2007	Huang	370/352
2007/0091906	A1 *	4/2007	Croy et al.	370/401
2008/0285547	A1 *	11/2008	Lee et al.	370/352
2009/0279683	A1 *	11/2009	Gisby et al.	379/201.02
2011/0211531	A1 *	9/2011	Woodson et al.	370/328

* cited by examiner

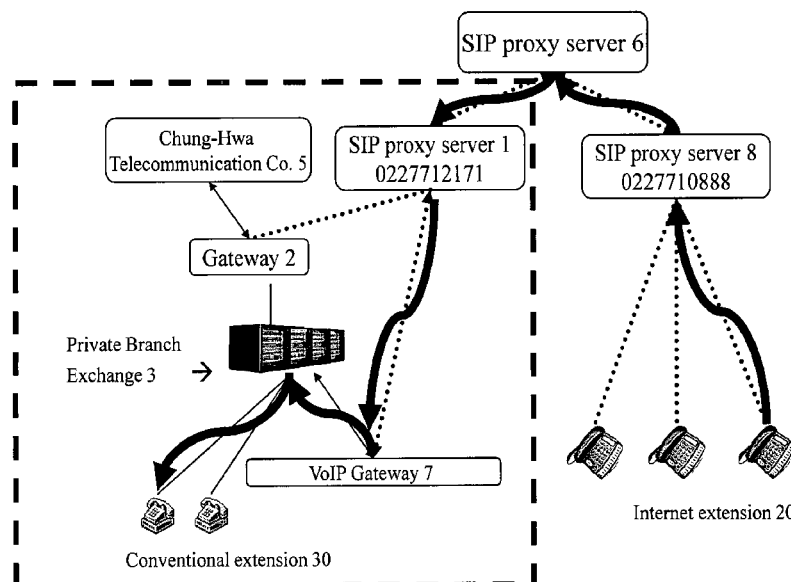
Primary Examiner — Khaled Kassim

(74) *Attorney, Agent, or Firm* — Bacon & Thomas, PLLC

(57) **ABSTRACT**

A system for dialing from Internet extension of other SIP proxy server to conventional extension is disclosed. A VoIP gateway or an IP auto attendant is used for dialing from Internet extension to conventional extension. The phone number of the Private Branch Exchange and the voice guidance are not needed. The calling number of SIP message is interpreted directly and converted into DTMF (Dual-tone multi-frequency) messages for dialing into a conventional extension.

3 Claims, 9 Drawing Sheets



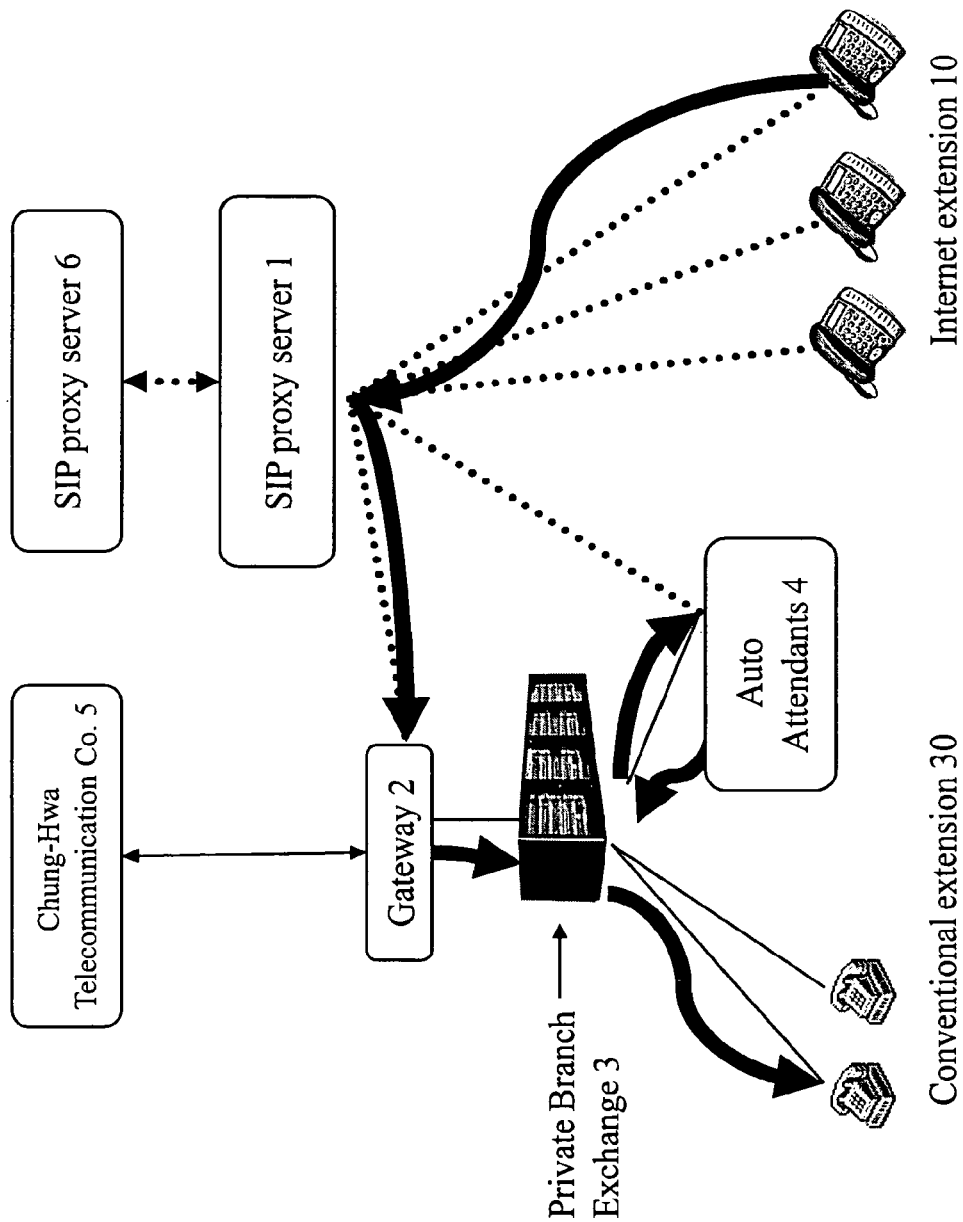


Fig. 1 (prior art)

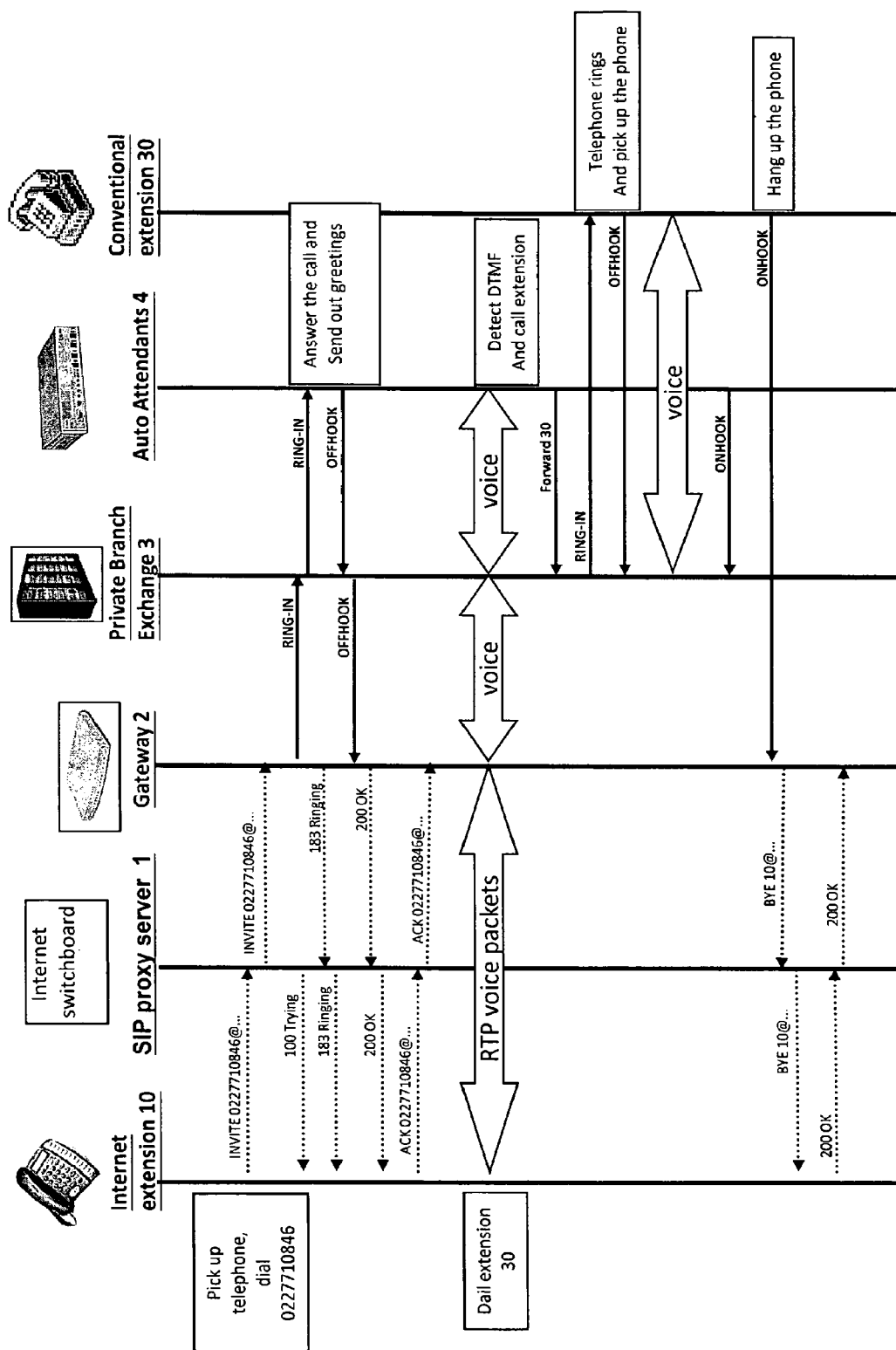


Fig. 2 (prior art)

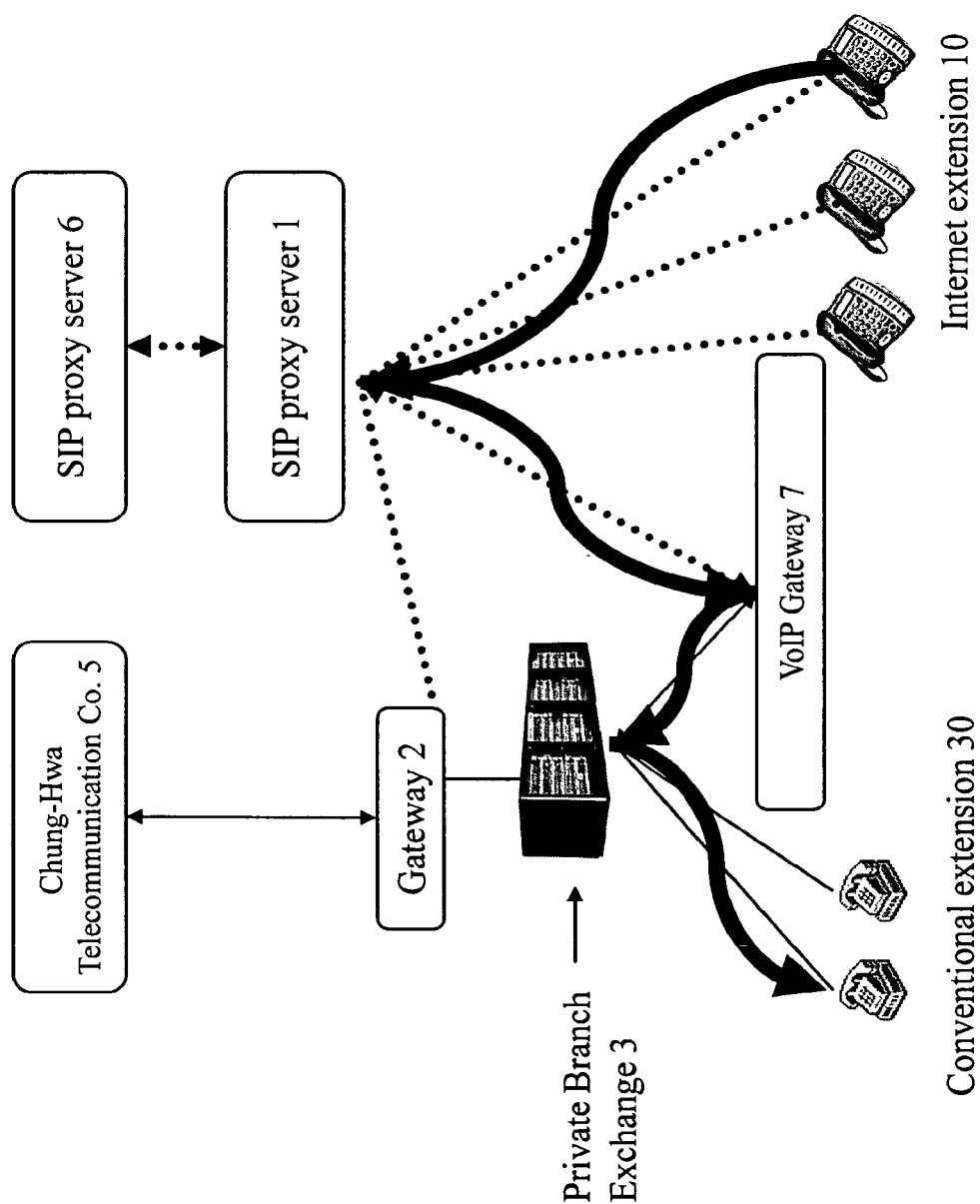


Fig. 3

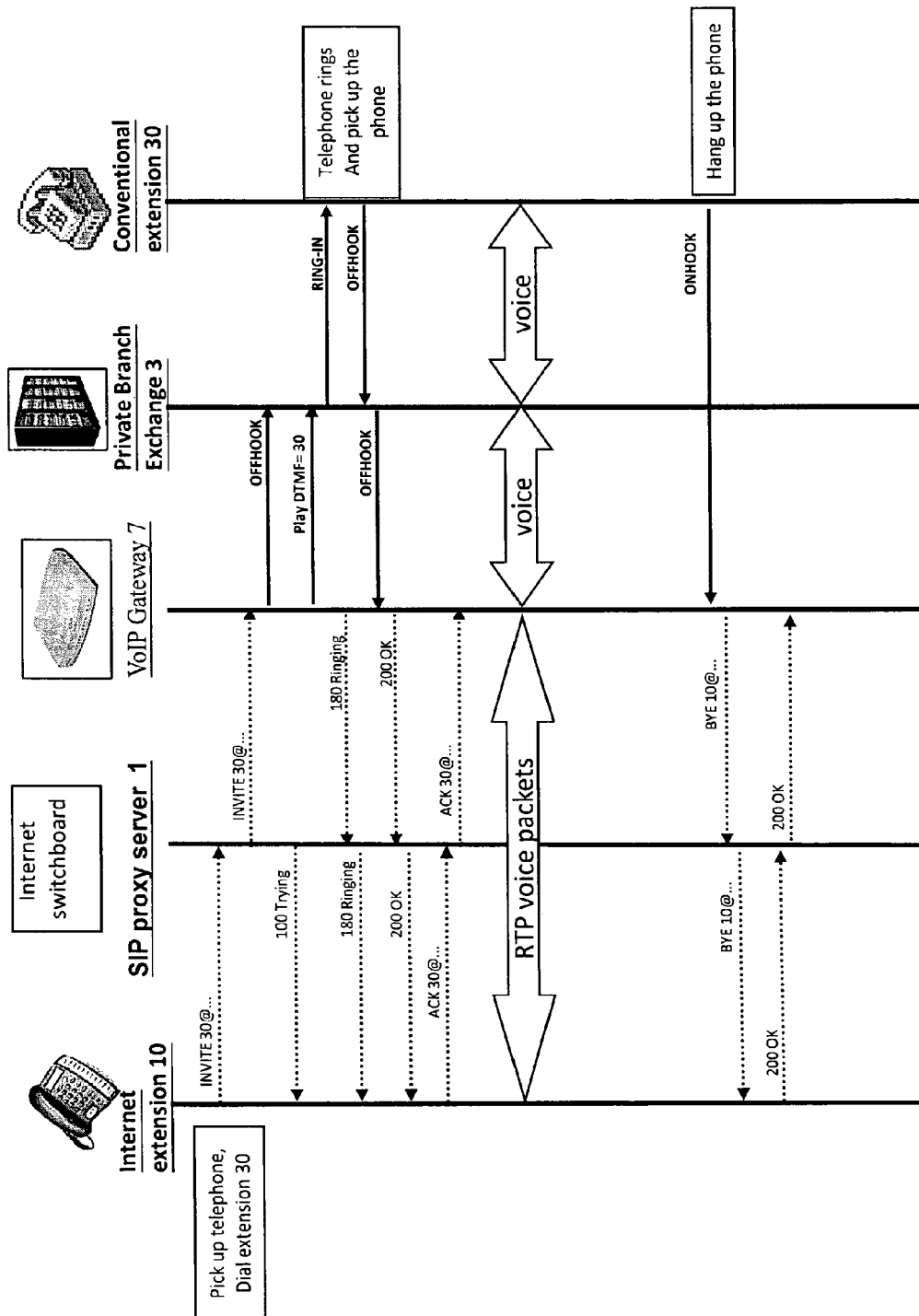


Fig. 4

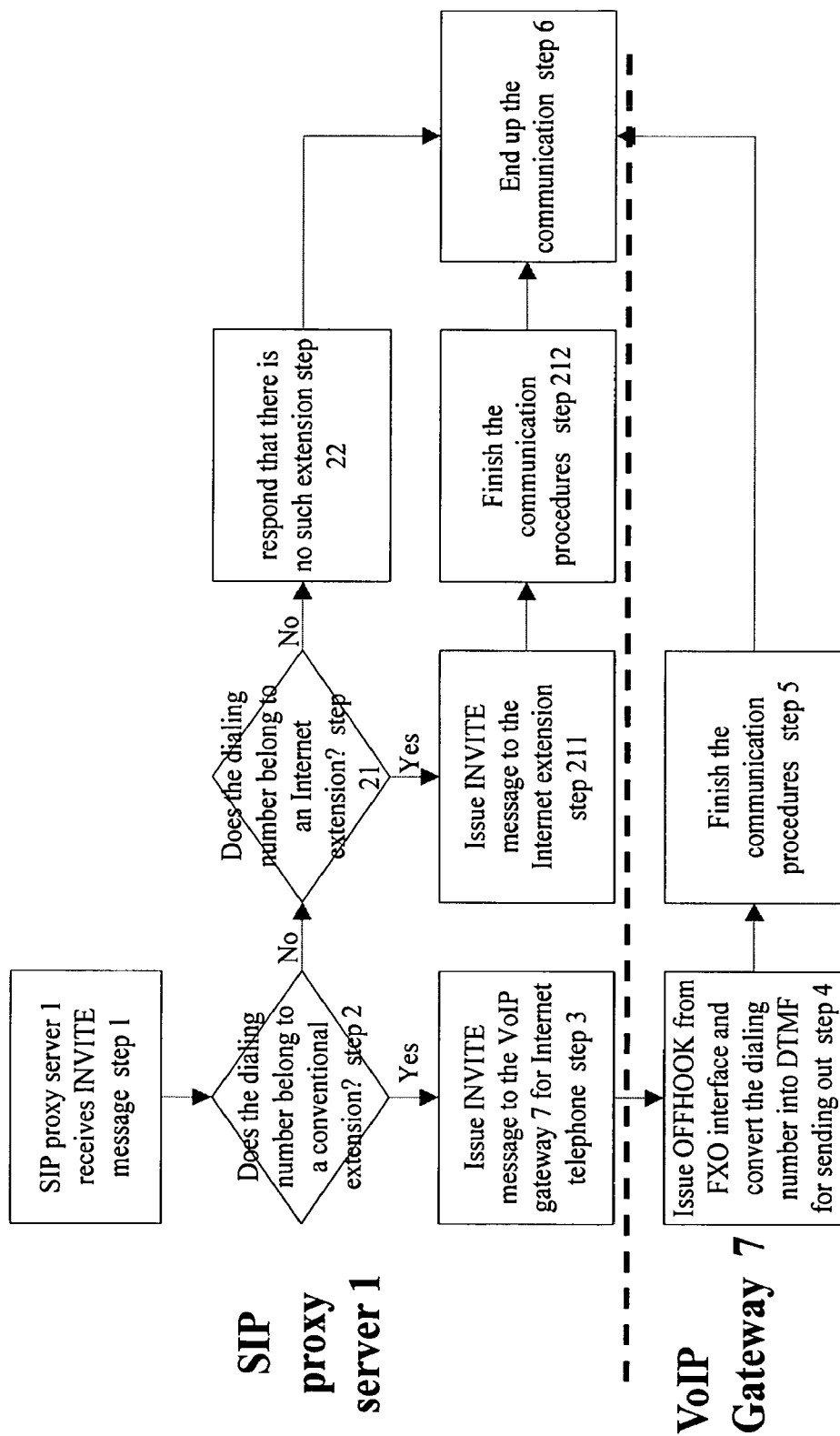


Fig. 5

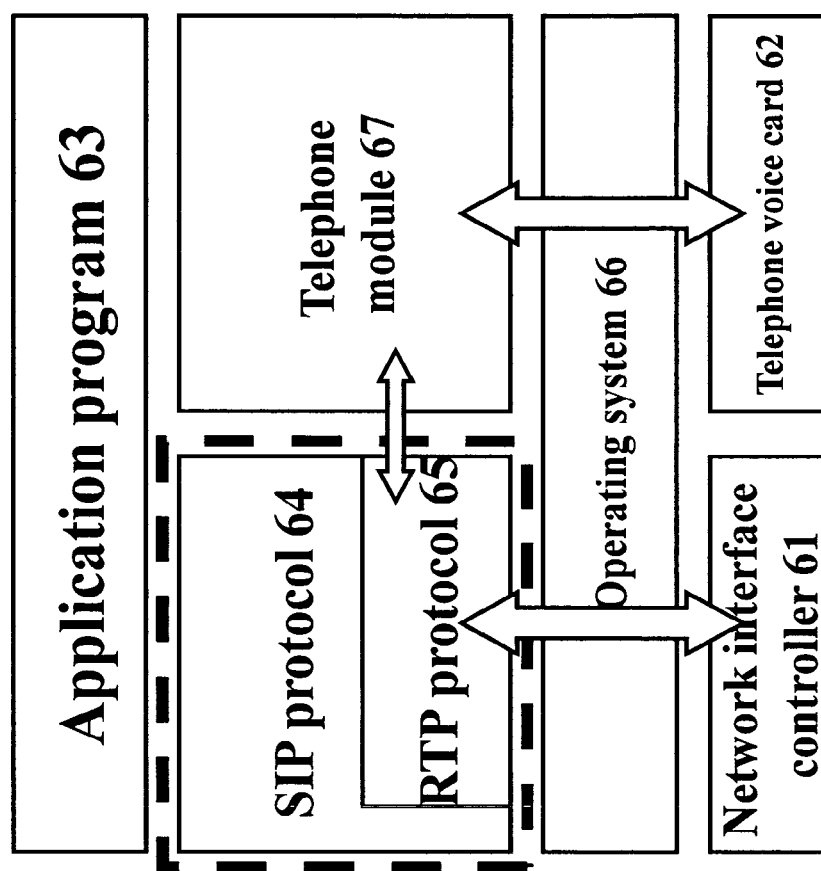


Fig. 6

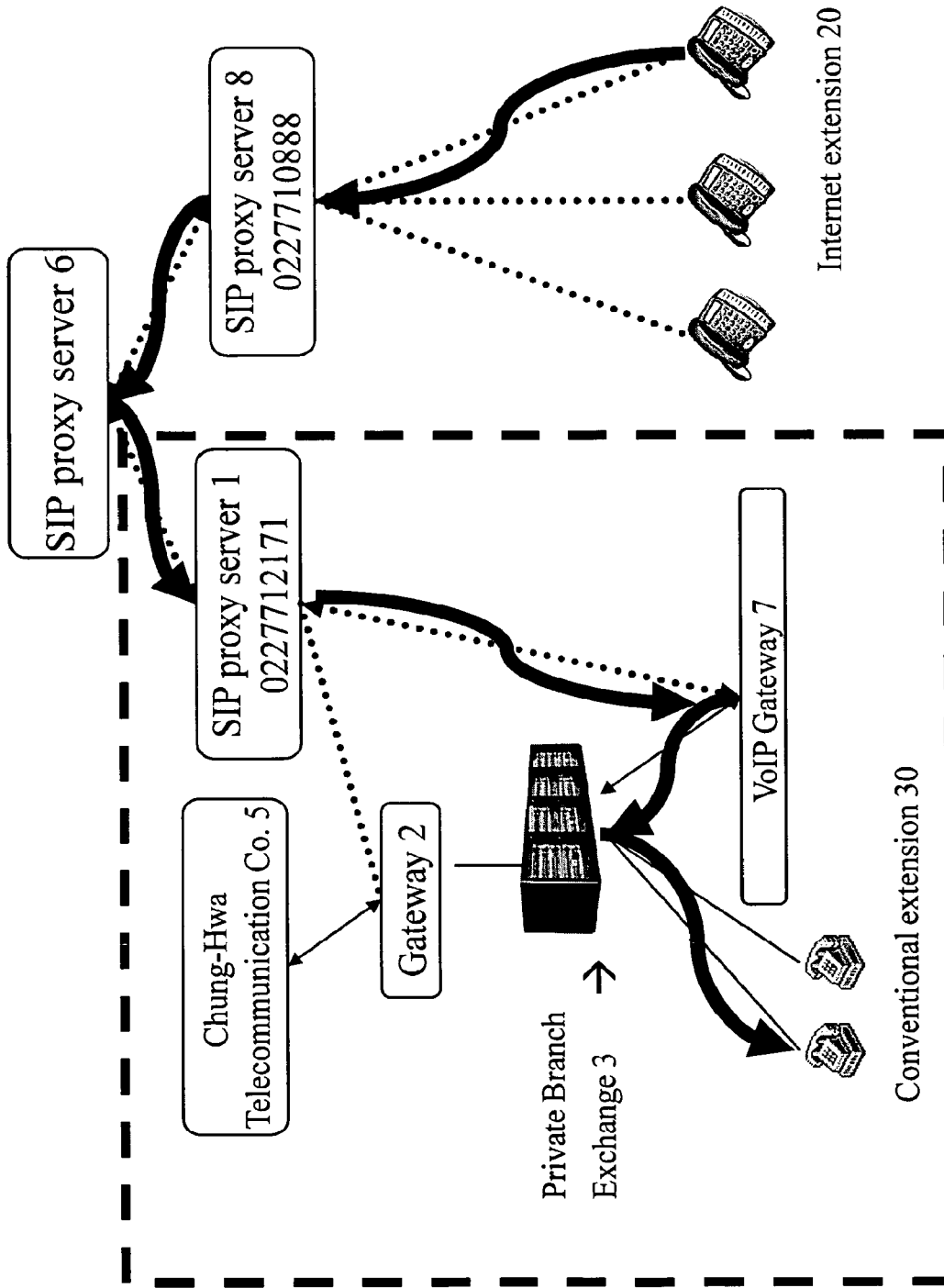


Fig. 7

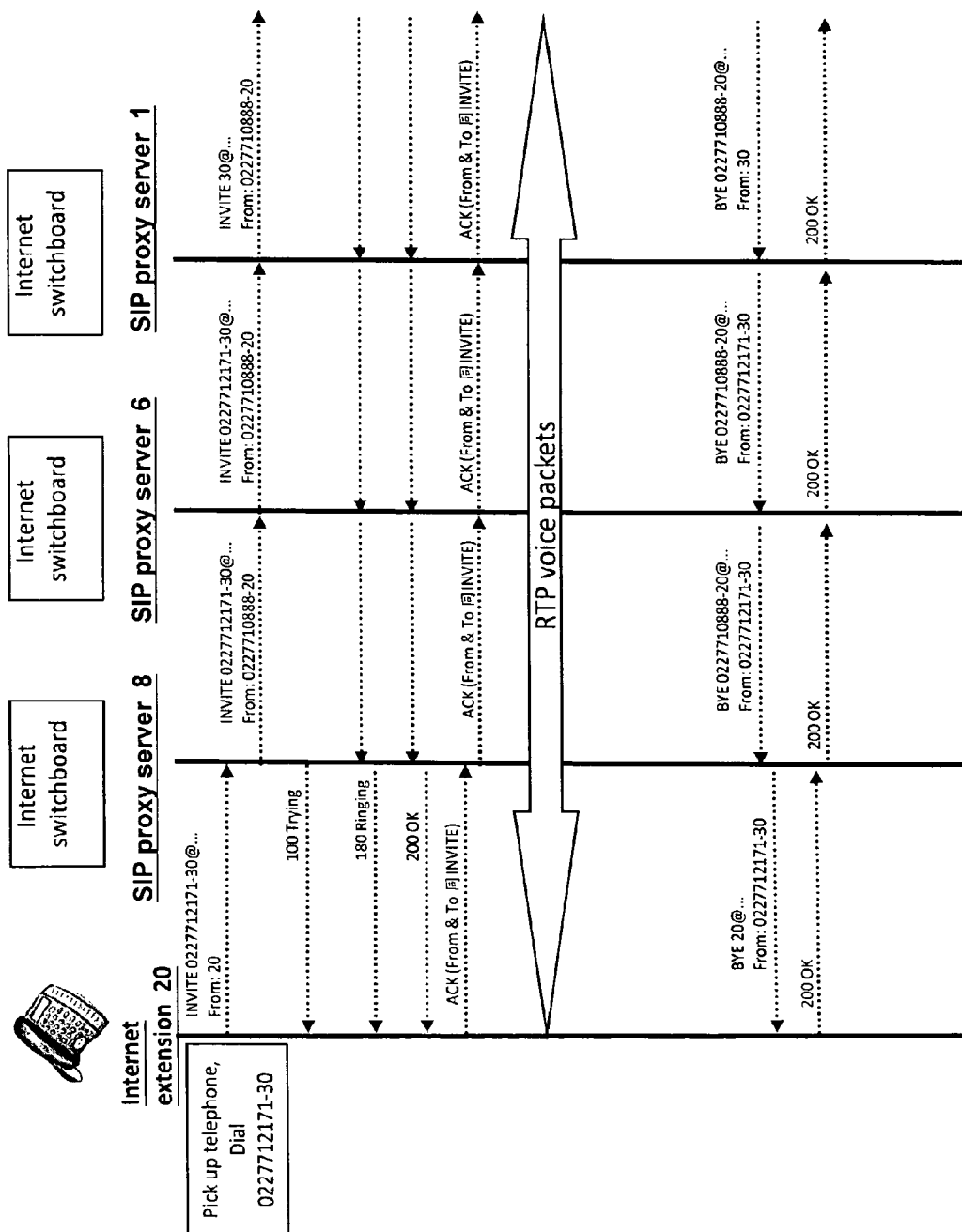


Fig.8

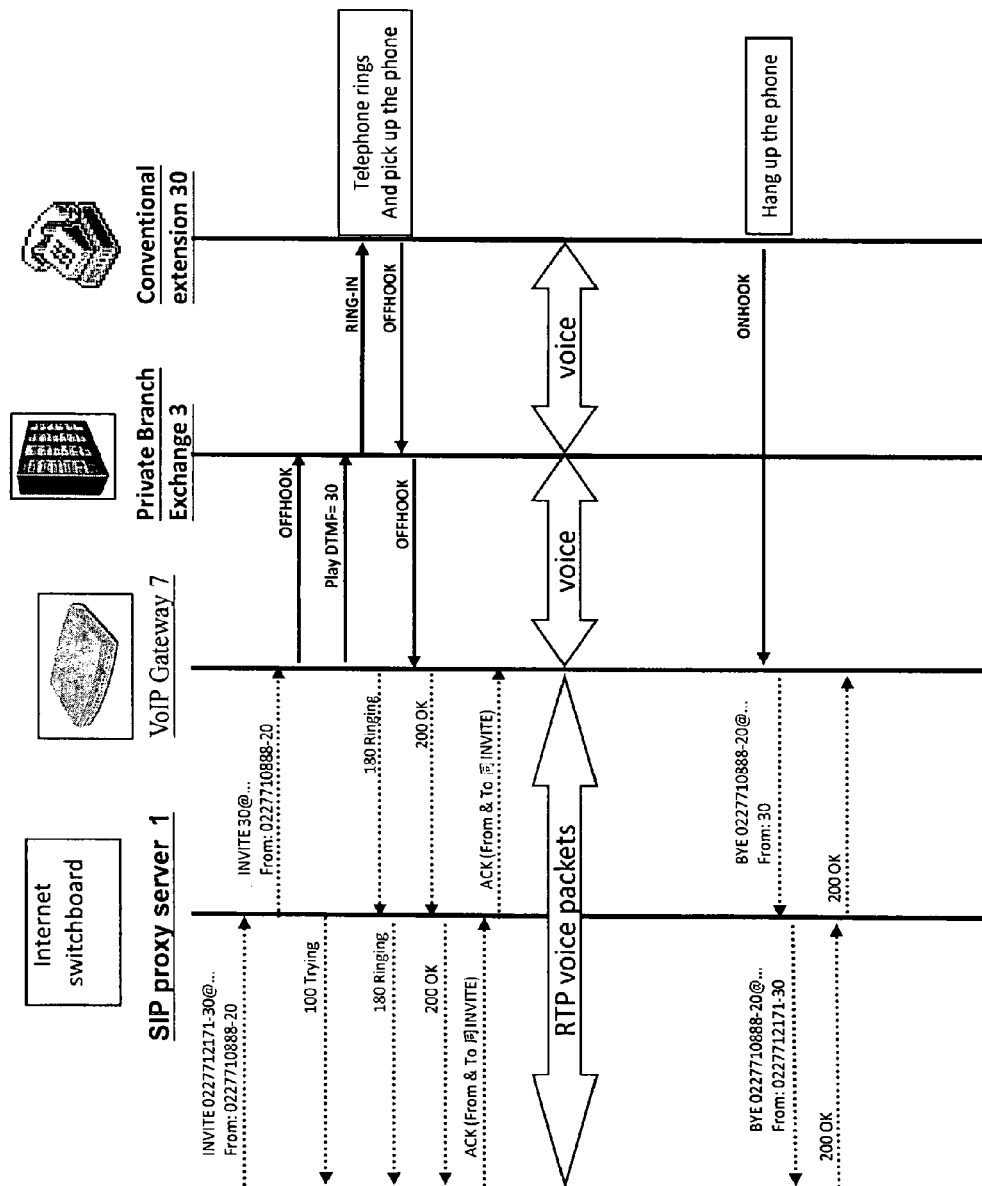


Fig. 9

METHOD FOR DIALING FROM INTERNET EXTENSION TO CONVENTIONAL EXTENSION

The present application is a divisional application of U.S. patent application Ser. No. 12/585,905 for claim 6 thereof, and claims the original priority date Jul. 1, 2009 of Taiwan Application No. 098122179.

FIELD OF THE INVENTION

The present invention relates to a system for dialing from internet extension to conventional extension, and more particularly to a system by using a VoIP gateway or an IP auto attendant to interpret SIP messages and convert into DTMF (Dual-tone multi-frequency) signals for being read by a Private Branch Exchange (PBX).

BACKGROUND OF THE INVENTION

VoIP (Voice over Internet Protocol) is one of the popular communication technologies. In VoIP, SIP (Session Initiation Protocol) defined by IETF is the most widely used protocol because of its simple structure, expandability and easy operation.

In a conventional telephone system, the number of extensions is limited by the capacity of the Private Branch Exchange. A Private Branch Exchange with more capacity will have a higher price. Therefore it is often to combine an Internet telephone system into a conventional telephone system for increasing the extensions and for upgrading into an IP telephone system so as to provide a more flexible expandability for extensions.

FIG. 1 shows a conventional IP telephone system, which is designed in an elementary school. The Internet telephone system comprises an SIP proxy server **1** and Internet extensions **10**. The conventional telephone system comprises a gateway **2** of conventional telephone system, a Private Branch Exchange (PBX) **3**, an auto attendant **4** and conventional extensions **30**. The SIP proxy server **1** of the Internet telephone system connects with an upper SIP proxy server **6** of Taipei Education Bureau. The gateway **2** of conventional telephone system connects with Chung-Hwa Telecommunication Co. **5**. SIP proxy server **1** connects with Internet extensions **10**, auto attendant **4**, gateway **2** and SIP proxy server **6** by Internet indicated by dotted lines. Chung-Hwa Telecommunication Co. **5**, gateway **2**, Private Branch Exchange **3**, auto attendant **4** and conventional extensions **30** are connected by conventional telephone lines indicated by solid lines, as shown in the figure.

A dialing from an Internet extension **10** to a conventional extension **30** has to dial the telephone number of the Private Branch Exchange **3** first so as to pass through SIP proxy server **1**, gateway **2**, Private Branch Exchange **3**, and then answered by the auto attendant **4** for providing a voice guidance, thereafter dial the number **30** of the conventional extension **30** so that a connection between the Private Branch Exchange **3** and the conventional extension **30** is established, as shown by the bold solid arrow lines in FIG. **1**.

The dialing described above has to dial the telephone number of the Private Branch Exchange **3** first and then directed by a voice guidance, it is not convenient.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a system in IP telephone system for dialing from an Internet extension to

a conventional extension by dialing directly the telephone number of the conventional extension without dialing a telephone number of the Private Branch Exchange and without voice guidance.

The system for dialing from internet extension to conventional extension according to the present invention comprises:

an upper SIP proxy server;

a first lower SIP proxy server having a first switchboard telephone number and being connected with an Internet extension by Internet;

a second lower SIP proxy server having a second switchboard telephone number and being connected with a VoIP gateway by Internet;

the upper SIP proxy server is connected with the first lower SIP proxy server and the second lower SIP proxy server by Internet;

a Private Branch Exchange is connected with a conventional extension, the VoIP gateway by conventional telephone lines;

when dialing from the Internet extension to the conventional extension, just dial the second switchboard telephone number followed by a "-" and then a telephone number of the conventional extension, it is not necessary to dial a telephone number of the Private Branch Exchange, and no voice guidance is needed.

The VoIP gateway has a telephone port and an Internet port, the telephone port has an FXO interface for being connected with an FXS interface of the Private Branch Exchange; the Internet port being connected with the second lower SIP proxy server by Internet.

The VoIP gateway can be replaced by an IP auto attendant. The IP auto attendant is a computer-telephone integration system comprised of a computer, a Network interface controller and a telephone voice card, and an application program is designed for controlling.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows schematically the diagram of a conventional IP telephone system for dialing from Internet extension to conventional extension.

FIG. **2** shows the message flow chart of a conventional IP telephone system for dialing from Internet extension to conventional extension.

FIG. **3** shows schematically the improvement of the IP telephone system for dialing from Internet extension to conventional extension according to U.S. patent application Ser. No. 12/585,905.

FIG. **4** shows the message flow chart of the IP telephone system for dialing from Internet extension to conventional extension according to U.S. patent application Ser. No. 12/585,905.

FIG. **5** is the functional flow chart between the SIP proxy server and the VoIP gateway with FXO interface according to the present invention and U.S. patent application Ser. No. 12/585,905.

FIG. **6** shows schematically the block diagrams of the IP auto attendant having both functions of the Internet telephone and the conventional telephone according to the present invention and U.S. patent application Ser. No. 12/585,905.

FIG. **7** is the system diagram for dialing from Internet extension of other SIP proxy server to conventional extension according to the present invention.

FIG. 8 and FIG. 9 are message flow charts for the system diagram in FIG. 7

DETAILED DESCRIPTIONS OF THE PREFERRED EMBODIMENTS

Introduction to SIP

A message is the basic unit for SIP to set up a speech communication. The message can be classified into "request" message and "response" message. A "request" is an SIP message from a client to a server to express the purpose of the client; while a "response" is an SIP message from a server to a client to answer the request from the client.

SIP request messages used in the present invention are shown in table 1 as below.

TABLE 1

SIP request messages used in the present invention	
requests	Descriptions
INVITE	A client requests setting up a speech communication.
BYE	To end up a successful speech communication. A request terminal for INVITE or a receiving terminal can issue such request.
ACK	A request that the client (issuing an INVITE) confirms to the server that a final response is received.
RING-IN	The server causes the receiving terminal to ring.
OFFHOOK	The receiving terminal receives the call.
Forward	Send out the telephone number.
ONHOOK	Hang up the phone.
Play DTMF	Convert into DTMF signals

SIP response messages used in the present invention are shown in table 2 as below.

TABLE 2

SIP response messages used in the present invention	
responses	Descriptions
100~199	The server has received a request, and the request is processed.
100 Trying	The server is processing the request from the client.
180 Ringing	The server causes the request terminal to ring.
200~299	The server accepts the request from the client.
200 OK	"200 OK" from the server means the "INVITE" is accepted, "200 OK" from the request terminal means the "BYE" is accepted, and the speech communication is ended.

Description of the Flow Chart in Conventional IP Telephone System

Referring to FIG. 2, a user dials the telephone number 0227710846 of the Private Branch Exchange 3 at the Internet extension 10, and issues message INVITE 0227710846@... for passing through the SIP proxy server 1 to the gateway 2; the gateway 2 issues RING-IN message to the Private Branch Exchange 3, then the Private Branch Exchange 3 transfers the RING-IN message to the auto attendant 4; the auto attendant 4 answers the call automatically and sends out greetings, issues OFFHOOK message for passing through the Private Branch Exchange 3 to the gateway 2; and then the gateway 2 issues messages of 183 Ringing and 200 OK to the SIP proxy server 1; the SIP proxy server 1 issues messages of 100

Trying, 183 Ringing and 200 OK to the Internet extension 10; the internet extension 10 returns with ACK 0227710846@... for passing through SIP proxy server 1 to the gateway 2, therefore confirms the dialing.

Thereafter the user dials the telephone number 30 of the conventional extension 30 directly to the auto attendant 4; the auto attendant 4 sends the telephone number 30 of the conventional extension 30 to the Private Branch Exchange 3 by message Forward 30; the Private Branch Exchange 3 issues RING-IN message to the conventional extension 30 and causes the conventional extension 30 to ring, then offhooked by someone and issuing OFFHOOK message to the Private Branch Exchange 3; and then a speech communication is conducted; the auto attendant 4 also issues ONHOOK message to the Private Branch Exchange 3 to end up the voice guidance. Once the conventional extension 30 hangs up the phone, the conventional extension 30 issues ONHOOK message to the gateway 2; the gateway 2 issues BYE 10@... for passing through SIP proxy server 1 to the Internet extension 10, then the Internet extension 10 issues 200 OK message to the gateway 2 to end up the communication.

Description of the IP Telephone System of U.S. patent application Ser. No. 12/585,905

The present invention is limited in the function for dialing from internet extension to conventional extension. The concept of U.S. patent application Ser. No. 12/585,905 is the basic of the present application.

Referring to FIG. 3, which shows the system diagram of U.S. patent application Ser. No. 12/585,905, including an SIP proxy server 1, Internet extensions 10 for Internet telephone; a gateway 2, a Private Branch Exchange 3, conventional extensions 30 for conventional telephone; and VoIP gateway 7. The SIP proxy server 1 of the Internet telephone connects with an upper SIP proxy server 6 of Taipei Education Bureau. The gateway 2 of the conventional telephone connects with Chung-Hwa Telecommunication Co. 5. The SIP proxy server 1 connects with the Internet extensions 30, the VoIP gateway 7, the gateway 2 and the SIP proxy server 6 by Internet indicated by dotted lines. The Chung-Hwa Telecommunication Co. 5, the gateway 2, the Private Branch Exchange 3, the VoIP gateway 7 and the conventional extensions 30 are connected by conventional telephone lines indicated by solid lines, as shown in the figure.

A dialing from the Internet extension 10 to the conventional extension 30 will pass through the SIP proxy server 1, the VoIP gateway 7, the Private Branch Exchange 3 directly to the conventional extension 30, as shown by the bold solid arrow lines in FIG. 3. FIG. 3 is different from FIG. 1 in that it is not necessary to go through the gateway 2 and there is no voice guidance in FIG. 3, a user can dial the number 30 of the conventional extension 30 directly at the Internet extension 10, it is not necessary to dial the telephone number of the Private Branch Exchange 3.

Referring to FIG. 4, a flow chart in IP telephone system of the U.S. patent application Ser. No. 12/585,905 is described. A user picks up the telephone at the Internet extension 10 for dialing the telephone number 30 of the conventional extension 30, a message Invite 30@... is issued for passing through the SIP proxy server 1 to the VoIP gateway 7, and then the VoIP gateway 7 issues OFFHOOK message and Play DTMF=30 message to the Private Branch Exchange 3; thereafter the Private Branch Exchange 3 issues RING-IN message and causes the conventional extension 30 to ring; the conventional extension 30 was offhooked by someone so as to issue OFFHOOK message for passing through the Private Branch

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Exchange 3 to the VoIP gateway 7; and then the VoIP gateway 7 issues 180 Ringing and 200 OK messages for passing through the SIP proxy server 1 to the Internet extension 10; the SIP proxy server will issue 100 Trying message simultaneously to the Internet extension 10; the Internet extension 10 will return with a message ACK 30@... for passing through the SIP proxy server 1 to the VoIP gateway 7, means the communication is conducted, so the Internet extension 10 and the conventional extension 30 passes RTP (Real-time Transport Protocol) speech packets and voice with each other, as shown in the figure. After the communication is ended, the conventional extension 30 hangs up the telephone, a message ONHOOK is issued to the VoIP gateway 7; the VoIP gateway 7 will then issue Bye 10@... message for passing through the SIP proxy server 1 to the conventional extension 10; the conventional extension 10 returns with 200 OK message for passing through the SIP proxy server 1 to the VoIP gateway 7, so the communication is ended.

Description of the Function of the VoIP Gateway 7

The VoIP gateway 7 is a device between conventional PSTN telephone and IP Internet. It has an Internet port and a telephone port, RJ-45 port is usually used for the Internet port, while RJ-11 port is used for the telephone port. RJ-11 port has two specifications of FXS (Foreign exchange station) and FXO (Foreign exchange office). The present invention uses the Tenor AS Series gateway of QUINTUM, which has both the FXS and FXO specifications.

If the VoIP gateway 7 is to connect with FXO port of the Private Branch Exchange 3, then an FXS gateway has to be used; if the VoIP gateway 7 is to connect with FXS port of the Private Branch Exchange 3, then an FXO gateway has to be used. The present invention uses a VoIP gateway 7 having FXO port for being connected with FXS port of the Private Branch Exchange 3.

The present invention is limited in the function for dialing from Internet extension to conventional extension.

The VoIP gateway 7 has to set up parameters at the beginning as below:

- a. close up the FXS port;
- b. set up an account number of Internet telephone for being registered in the SIP proxy server 1;
- c. set up a route from the Internet port to the FXO port so that the SIP message entered from the Internet port can be converted into SS7 (Signaling System No. 7) message to be sent out through the telephone port.

When Internet extension 10 or Internet extension 20 (referring to FIG. 7) dials the conventional extension 30, for message part (SIP and SS7 messages): Internet extension 10 or Internet extension 20 (referring to FIG. 7) sends the Internet telephone messages for passing through the SIP proxy server 1 to the Internet port of the VoIP gateway 7, and then the VoIP gateway 7 analyzes the dialing number for passing through the telephone port to the Private Branch Exchange 3 and then to the conventional extension 30; on the contrary, the conventional extension 30 returns with the conventional telephone message for passing through the telephone port, and then being converted into a corresponding Internet telephone message for sending to the Internet extension 10 or Internet extension 20 (referring to FIG. 7). For voice part: the voice packets received from the Internet port by the VoIP gateway 7 will be converted into voice signals for sending out through the telephone port; on the contrary, the voice signals received from the telephone port will be converted into voice packets for sending out through the Internet port.

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Referring to FIG. 5, which is the functional flow chart between the SIP proxy server 1 and the VoIP gateway 7 with FXO interface. When the SIP proxy server 1 receives INVITE message issued from the Internet extension 10 or Internet extension 20 (referring to FIG. 7) (step 1); the dialing number is analyzed to see if it belongs to a conventional extension (step 2); if the dialing number does not belong to a conventional extension, then it is analyzed to see if it belongs to an Internet extension (step 21), if yes, then the SIP proxy server 1 issues the INVITE message to the Internet extension (step 211), and finishes ringing, offhook, communication, onhook procedures (step 212), and then ends up the communication (step 6); if the dialing number is not a number of an Internet extension, then the SIP proxy server 1 responds that there is no such extension (step 22), and ends up the communication (step 6).

If the dialing number is a conventional extension number, then the SIP proxy server 1 will issue INVITE message to the VoIP gateway 7 (step 3). When the VoIP gateway 7 receives the message from the Internet port, an OFFHOOK message will be issued through the telephone port, and then the dialing number will be converted into DTMF signals for sending out through the telephone port (step 4), thereafter finish ringing, offhook, communication, onhook procedures (step 5), and then end up the communication (step 6).

Description of the IP Auto Attendant

The VoIP gateway 7 can be replaced by the IP auto attendant. IP auto attendant is a computer-telephone integration system (CTI) comprised of a computer, a network interface controller and a telephone voice card (EVS (Electronic Voice Services) Dialogic D/4PCI-UFW). The telephone voice card is an interface card used for processing the voice on the telephone, having functions of OFFHOOK, ONHOOK, DTMF, Busy Tone, Disconnected Tone, Flash, etc. The IP auto attendant connects to the Internet through the network interface controller for sending or receiving Internet packets, including SIP messages and RTP voice packets of VoIP. The IP auto attendant connects to the conventional telephone network (PSTN) through the telephone voice card for detecting or issuing SS7 (Signaling System No. 7) messages and voice signals. An application program can be designed for the IP auto attendant to control the API (Application Programming Interface) of the network interface controller and the telephone voice card so as to achieve integration function for the Internet and telephone.

As to the function design thereof, as shown in FIG. 6, the IP auto attendant has to have a network interface controller 61 and a telephone voice card 62, and an application program 63 is designed for controlling the network interface controller 61 and the telephone voice card 62. The message between Internet and telephone used in the present invention is SIP (Session Initiation Protocol) 64, the voice transmission used in the present invention is RTP (Real-time Transport Protocol) 65. The Internet packets are transmitted and received through an operating system 66 by the network interface controller 61; the telephone module 67 uses the API provided by the telephone voice card 62 through the operating system 66 to control messages and voice of the telephone voice card 62.

The IP auto attendant has the function to process Internet telephone and conventional telephone, so it can provide four aspects for communication: 1. dialing between the Internet extensions; 2. dialing between the conventional telephones; 3. dialing from Internet extension to conventional extension; 4. dialing from conventional extension to Internet extension.

The present invention only adopts the third aspect of dialing from Internet extension to conventional extension. When Internet extension 10 or Internet extension 20 (referring to

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FIG. 7) dials a conventional extension 30, for message part: IP auto attendant receives Internet telephone messages sent from Internet extension 10 or Internet extension 20 (referring to FIG. 7) through the SIP proxy server 1 by the network interface controller 61, analyzes the dialing number from the Internet packets, and then sends message by the telephone voice card 62 to the Private Branch Exchange 3; on the contrary, when the telephone voice card 62 receives conventional telephone messages returned from the conventional extension 30, the conventional telephone messages will be converted into corresponding Internet telephone messages and sent to Internet extension 10 or Internet extension 20 (referring to FIG. 7) by the network interface controller 61. For voice part: voice packets received from the network interface controller 61 by IP auto attendant will be converted into voice signals for transmission through the telephone voice card 62, while the voice signals received from the telephone voice card 62 will be converted into voice packets for transmission through the network interface controller 61.

Dialing from Internet Extension of Other SIP Proxy Server to Conventional Extension According to the Present Invention

Referring to FIG. 7, it is a system diagram for dialing from Internet extension 20 of other SIP proxy server 8 to conventional extension 30 according to the present invention. The telephone number of the SIP proxy server 8 is 0227710888. A user picks up telephone at the Internet extension 20 for dialing the conventional extension 30 of the SIP proxy server 1 (with telephone number 0227712171). FIG. 8 and FIG. 9 show the flow charts thereof.

The user picks up telephone at the Internet extension 20 and dials 0227712171-30, it means that the user wants to dial the conventional extension 30 under the SIP proxy server 1 (with telephone number 0227712171), so the Internet extension 20 issues INVITE message to the SIP proxy server 8. The SIP proxy server 8 knows that the dialing belongs to the SIP proxy server 1, so transmits the message packet to an upper SIP proxy server 6 of Taipei Education Bureau, and changes the parameter of "From" in the INVITE packet from "20" to "0227710888-20", it means that the call is from the Internet extension 20 under the switchboard telephone number 0227710888. SIP proxy server 6 determines a route by the telephone number and sends the packet to the SIP proxy server 1. After the SIP proxy server 1 receives the packet, it determines that the dialing is to the conventional extension 30, and changes the dialing number from "0227712171-30" to "30", and transmits to the VoIP gateway 7. Thereafter the flow chart is the same as that of dialing from Internet extension to conventional extension according to U.S. patent application Ser. No. 12/585,905, the only difference is that the SIP proxy server 1 has to process the number 0227712171 in receiving or transmitting packet. When the SIP proxy server 1 receives packet from the SIP proxy server 6, the "0227712171-" part of the dialing number has to be deleted and then sent to the VoIP gateway 7; when the SIP proxy server 1 receives packet from the VoIP gateway 7, the "0227712171-" has to be added into the dialing number.

The scope of the present invention depends upon the following claims, and is not limited by the above embodiments.

What is claimed is:

1. A system for dialing from internet extension to conventional extension, comprising:
 - an upper SIP proxy server;
 - a first lower SIP proxy server having a first switchboard telephone number and being connected with an Internet extension by Internet;

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a second lower SIP proxy server having a second switchboard telephone number and being connected with a VoIP gateway by Internet;

the upper SIP proxy server is connected with the first lower SIP proxy server and the second lower SIP proxy server by Internet;

a Private Branch Exchange is connected with a conventional extension, the VoIP gateway by conventional telephone lines;

wherein the VoIP gateway has a telephone port and an Internet port, the telephone port has an FXO interface for being connected with an FXS interface of the Private Branch Exchange;

the Internet port connects with the second lower SIP proxy server by Internet;

wherein if the VoIP gateway has an FXS interface, the FXS interface is closed, an account number of an Internet telephone is set up for being registered in the second lower SIP proxy server, then a route is set up from the Internet port to the FXO port so that an SIP message entered from the Internet port can be converted into SS7 message to send out through the telephone port;

wherein when the Internet extension dials the conventional extension, just dials the second switchboard telephone number followed by a "-" and then a telephone number of the conventional extension,

the Internet extension issues INVITE message to the first lower SIP proxy server, the first lower SIP proxy server knows that the dialing belongs to the second lower SIP proxy server, so transmits the message to the upper SIP proxy server, the upper SIP proxy server determines a route by the telephone number and sends the message to the second lower SIP proxy server; after the second lower SIP proxy server receives the message, it determines that the dialing is to the conventional extension, so transmits to the VoIP gateway;

the Internet extension sends an Internet telephone message for passing through the first lower SIP proxy server, the upper SIP proxy server, the second lower proxy server to the Internet port of the VoIP gateway;

wherein when the second lower SIP proxy server receives INVITE message issued from the Internet extension, the dialing number is analyzed to see if it belongs to a conventional extension; if the dialing number does not belong to a conventional extension, then it is analyzed to see if it belongs to another Internet extension, if yes, then the second lower SIP proxy server issues the INVITE message to the another Internet extension, and finishes ringing, offhook, communication, onhook procedures, and then ends up the communication; if the dialing number is not a number of an Internet extension, then the second lower SIP proxy server responds that there is no such extension, and ends up the communication; if the dialing number is a conventional extension number, then the second lower SIP proxy server will issue INVITE message to the VoIP gateway;

and then the VoIP gateway analyzes the dialing number for passing through the telephone port to the Private Branch Exchange and then to the conventional extension; the conventional extension returns with a conventional telephone message for passing through the Private Branch Exchange and then the telephone port, and then being converted into a corresponding Internet telephone message for sending through the Internet port and the second lower SIP proxy server, the upper SIP proxy server, the first lower SIP proxy server to the Internet extension; a voice packet received from the Internet port by the VoIP

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gateway will be converted into a voice signal for sending out through the telephone port to the Private Branch Exchange and then to the conventional extension; a voice signal received from the telephone port will be converted into a voice packet for sending out through the Internet port to the second lower SIP proxy server, the upper SIP proxy server, the first lower SIP proxy server and then to the Internet extension;

such that when dialing from the Internet extension to the conventional extension, just dial the second switchboard telephone number followed by a “-” and then a telephone number of the conventional extension, it is not necessary to dial a telephone number of the Private Branch Exchange, and no voice guidance is needed.

2. The system for dialing from internet extension to conventional extension according to claim 1, wherein the VoIP gateway can be replaced by an IP auto attendant.

3. The system for dialing from internet extension to conventional extension according to claim 2, wherein the IP auto attendant is a computer-telephone integration system comprised of a computer, a network interface controller and a telephone voice card, and an application program is designed

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so that when the Internet extension dials the conventional extension, the IP auto attendant receives Internet telephone messages sent from the Internet extension through the first lower SIP proxy server, the upper SIP proxy server, the second lower SIP proxy server by the Network interface controller, analyzes the dialing number from an Internet packet, and then sends message by the telephone voice card to the conventional extension through the Private Branch Exchange; when the telephone voice card receives a conventional telephone message returned from the conventional extension through the Private Branch Exchange, the conventional telephone message will be converted into a corresponding Internet telephone message and sent to the Internet extension through the second lower SIP proxy server, the upper SIP proxy server, the first lower SIP proxy server by the Network interface controller; a voice packet received from the Network interface controller will be converted into a voice signal for transmission through the telephone voice card, while a voice signal received from the telephone voice card will be converted into a voice packet for transmission through the Network interface controller.

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